> Warren et al discloses a computer controlled top drive drilling system programmed to operate servo valve 46 to rotate a drill string clockwise or counterclockwise and to receive several downhole signals to control a motor to advance the drill string at a predetermined angle.

A. Claims 1, 3, 5, and 7

Claims 1, 3, 5, and 7 were each rejected as being anticipated by Warren. Anticipation under 35 U.S.C. § 102(b) exists only if each element of the rejected claim is found in a single prior art reference. Here, a proper rejection of claims 1, 3, 5, and 7 under Warren requires that each element of the rejected claims be present in Warren.

Warren, however, does not disclose one or more of the elements of each of amended claims 1, 3, 5, and 7. Claims 1, 3, 5, and 7, as amended above, each claim a sensor that is located at the surface. The sensor monitors the rotation of a drill string or a motor at the surface. The data gathered by the sensor is transmitted to the computer to control the rotation of the drill string or motor.

Warren does not disclose a drilling system that includes a sensor located at the surface that is able to measure the rotation of the drill string. The measuring device of Warren is a "downhole telemetry measurement and transmission device 20" that is located near the drill bit rotation device 24 and drill bit 26. Warren provides:

> A drillstring is suspended within a wellbore with a downhole data collection and transmission device, such as a measurement-while-drilling MWD tool, and a drill bit rotation device, such as a downhole positive displacement motor (PDM) or turbine connected adjacent a drill bit at a lower end of the drillstring.
> . . .

> While drilling the wellbore, values of these drilling associated parameters are inputted to a memory associated with a programmable digital computer.

(column 2, lines 19-38).

> A downhole telemetry measurement and transmission device 20, commonly referred to as a measurement-while-drilling (MWD) tool is connected to a lower end of the drillstring 14 and transmits drilling associated parameters to the surface by mud pulse or electromagnetic transmission. These signals are received at the surface by a data receiving device 22, which is commercially available and necessary with use of an MWD tool. A bent sub 23 is connected to the drillstring 14 adjacent to the MWD tool 16 for assistance in drilling an inclined wellbore. A bent housing on a motor or eccentric stabilizers can also be used. A downhole drill bit rotation device 24, such as a positive-displacement-motor (PDM) or downhole turbine, is connected to the drillstring and a drill bit 26 is connected to the lower end thereof.

(column 3, lines 41-56).

> A first drillstring orientation is chosen and the drillstring is locked into place by preventing the rotary table 18 and /or power swivel or top drive 12 from rotating. Drilling is commenced and the MWD signals are sent to computer 28 and display device 30.

(column 4, lines 22-32). Warren makes no mention of sensing drilling parameters at the surface. Rather, all drilling parameters that are input to the computer of Warren for control of the rotation of the drillstring are measured at the MWD tool near the drill rotation device or drill bit and then transmitted to the surface. Importantly, Warren makes no reference to measuring drilling parameters at the surface.

In contrast, in the drill string or drilling method of claims 1, 3, 5, and 7, a sensor is located at the surface. The placement of a sensor at the surface is advantageous because the rotation of the drill string at the surface can be measured and this information can be used as a parameter in

the directional drilling process. In contrast with the drill string of amended claims 1, 3, 5, and 7, the rotation of the drill string of Warren is not measured.

Measuring the rotation of the drill string at the surface allows the driller to measure accurately and take advantage of the elastic properties of the drill string. Directional drilling is aided if the elastic properties of the drill string are known, measured, and used for the benefit of the directional drilling process. For example, oscillation between the drill string at the surface and the drill bit reduces friction between the drill string and the well bore in the directional drilling process. The elastic properties of the drill string cannot be controlled unless the rotation of the drill string is measured at the surface with reference to a known measurement point. Measuring the rotation of the drill string at the surface while also measuring drilling parameters in the well bore allows the directional drilling process to harness the elastic properties of the drill string as an aid in the directional drilling process. Moreover, if the rotation of the drill string at the surface is not measured, the drill string may experience backlash if the drill bit is improperly oriented with respect to the rotation of the drill string at the surface.

Because Warren does not disclose the use of a sensor at the surface, the directional drilling process of Warren does not take advantage of the elastic properties of the drill string and may experience undesirable backlash as a result. In sum, Warren does not anticipate amended claims 1, 3, 5, and 7 because Warren does not disclose each of the elements of amended claims 1, 3, 5, and 7, including the placement of sensors at the surface. Because Warren does not disclose each element of the rejected claims, the rejection of claims 1, 3, 5, and 7 under 35 U.S.C. § 102(b) should be withdrawn.

B. Claims 2 and 6

Claims 2 and 6 were rejected under 35 U.S.C. § 103(a) over Warren in combination with other unidentified prior art. To establish a prima facie case of obviousness, there must be some suggestion or motivation in the prior art to modify the reference or references such that the modified reference or references disclose each element of each rejected claim. With respect to claims 2 and 6, the office action recognizes that Warren does not disclose the ability to rotate the drill string to advance the drill string according to a predetermined angle in the forward and reverse directions, or the ability to oscillate the drill string between predetermined angles. Because this disclosure is not shown in Warren, there must be some suggestion or motivation in the prior art for modifying Warren to include the claimed elements of claims 2 and 6.

The office action does not identify the source of the suggestion or motivation in the prior art for modifying Warren. Advancing the drill string at a predetermined angle in the reverse and forward directions is a not a trivial matter. Rather, such controlled movement on the part of the drill string permits more effective directional drilling by dispersing the weight of the drill string and the weight applied to the bit. Controlled angular movement of the drill string also takes advantage of the elastic forces of the drill string in the directional drilling process. Controlled angular movement of the drill string permits elastic forces to be induced in and released from the drill string. Control and management of these elastic forces is an aid to the directional drilling process. Nowhere is this technique disclosed in Warren and nowhere is it disclosed in any other prior art identified in the office action. Because no suggestion or motivation for modifying Warren is disclosed in the prior art, a prima facie case of obviousness has not been established. Manual of Patent Examining Procedure (MPEP) 2143.01.

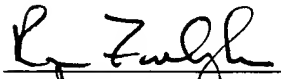
The office action does not identify art other than Warren in support of the obviousness rejection. The office action simply states that "it is deemed . . . that it would have been obvious to one of ordinary skill in the art" to have made the proposed changes to Warren. In view of the office action's reliance on well known or deemed prior art, the applicant seasonably and respectfully traverses the Examiner's conclusion as to conclusion that well known or deemed prior art that would provide a suggestion or motivation for modifying Warren as indicated in the office action. MPEP 2144.03. Applicant is aware of no prior art that would provide a suggestion or motivation for the modifications to Warren proposed by the Examiner. In view of the applicant's traversal, applicant respectfully requests that the Examiner cite a reference in support of the position taken in the office action. MPEP 2144.03.

In sum, there is no motivation or suggestion in the prior art for modifying Warren to permit the technique of moving the drill string between rotation angles in the forward and reverse direction. As such, a prima facie case of obviousness has not been established, and the rejection of claims 2 and 6 under 35 U.S.C. § 103(a) should be withdrawn.

C. Conclusion

In view of the above amendments and remarks, Applicant requests reconsideration of the rejection of claims 1-3 and 5-7. Applicant submits that the rejection of claims 1-3 and 5-7 should be withdrawn and that these claims should be passed to issuance.

Respectfully submitted,



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Date: November 8, 1999